SCHENLEY PARK BRIDGE OVER PANTHER HOLLOW
(Panther Hollow Bridge)
Pennsylvania Historic Bridges Recording Project - II
Spanning Panther Hollow at Panther Hollow Rd.
Pittsburgh
Allegheny County
Pennsylvania

HAER No. PA-489

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

SCHENLEY PARK BRIDGE OVER PANTHER HOLLOW
(Panther Hollow Bridge)

HAER No. PA-489

Location:	Spanning Panther Hollow at Panther Hollow Rd., Pittsburgh, Allegheny County, Pennsylvania.
USGS Quadrangle:	Pittsburgh West, Pennsylvania (7.5-minute series, 1993).
UTM Coordinates:	17/589320/4476790
Dates of Construction:	1895-96.
Designer:	City of Pittsburgh, Department of Public Works.
Builder:	Schultz Bridge & Iron Works (McKee's Rocks).
Present Owner:	City of Pittsburgh.
Present Use:	Vehicular bridge.
Significance:	Schenley Park Bridge over Panther Hollow includes design elements from the City Beautiful movement while utilizing Pittsburgh's "native" industry: steel. An elegant three-hinged steel arch, the bridge is a contributing structure to Phipps Conservatory and the Schenley Park Historic District, both listed in the National Register of Historic Places.
Historian:	Haven Hawley, August 1998.
Project Description:	The Pennsylvania Historic Bridges Recording Project II was co-sponsored during the summer of 1998 by HABS/HAER under the general direction of E. Blaine Cliver, Chief; the Pennsylvania Department of Transportation, Bureau of Environmental Quality, Wayne W. Kober, Director; and the Pennsylvania Historical and Museum Commission, Brent D. Glass, Executive Director and State Historic Preservation Officer. The fieldwork, measured drawings, historical reports and photographs were prepared under the direction of Eric DeLony, Chief of HAER.

Pittsburgh made a delayed entrance to the parks movement that swept urban American centers in the mid-nineteenth century, best represented by Frederick Law Olmsted's Central Park in New York City. The neighboring city of Allegheny, Pittsburgh's commercial and political competitor on the North Side, examined the public parks of Philadelphia, New York, and Baltimore before developing its own in the late 1860s.[1] Pittsburgh, however, remained aloof of city-sponsored beautification efforts until the broader City Beautiful movement began taking shape in the 1890s. Inspired by the technological achievement of beauty at the World's Columbian Exposition of 1893, a growing number of city leaders such as those in Pittsburgh began to envision ways of reconciling industrial progress with a return to nature — albeit one artificially constructed.

Schenley Park Bridge over Panther Hollow made accessible to citizens the first public park in Pittsburgh, built as the City Beautiful movement began taking shape. A graceful three-hinged arch exemplifying the beauty and strength possible with steel construction, the bridge over Panther Hollow symbolized the dominance of a new social elite controlling the city's rising steel industry. In its design and funding, the bridge served as a link between nature and technology, bringing together the parks movement with Pittsburgh's heavy industrial base.

Phipps Conservatory and Schenley Park

The downtown parks of nearby Allegheny included a lush conservatory donated by steel magnate Henry Phipps, Jr., and the sculpted landscaping and walkways were "the resort of thousands of Pittsburgers until the park mania, after years of agitation, took hold of the city officials of Pittsburg and induced them to act."[2] Urban beautification and recreation areas became another means of municipal competition, with Pittsburgh creating Schenley Park and Allegheny adding Riverview Park to its existing system in the final decade of the nineteenth century.

Phipps donated a conservatory to Pittsburgh as well in the early 1890s, which was built in Schenley Park on the north side of Panther Hollow. Gardeners tended plants for display in the conservatory itself or for outdoor landscaping in Schenley, Herron Hill, and Bedford parks.[3] In 1896, Phipps added a gift of $30,000 to construct propagating houses for storing materials and young plants in steam-heated structures.[4] The conservatory, an iron-and-glass structure with a main building and side wings planned for open-air cultivation of tropical and desert plants,

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[1] City of Allegheny, *Second Annual Report of the Park Commission of the City of Allegheny, 1869* (Pittsburgh: W. G. Johnston & Co., Printers, 1870), 9.

[2] J. M. Kelly, *Handbook of Greater Pittsburgh* (Pittsburgh: J. M. Kelly, 1895), 49.

[3] City of Pittsburgh, *Annual Report of the Department of Public Works, 1896* (Oil City, Pa.: Derrick Publishing Co., 1897), 330.

[4] "Lots Of Money Is Being Spent," *Pittsburg Post*, 6 Sep. 1896; "Will Plant 160,000 Trees," *Pittsburg Post*, 25 Jan. 1897.

adjoined the palm house and new propagating houses to create a giant greenhouse ranging through all three buildings. Together, the structures encompassed almost 1.75 acres.[5] Outside the conservatory, an electric fountain incorporated a bronze statue of Neptune atop a granite block in the bubbling fountain waters, combining nature, myth, and electrical power.[6]

The Phipps Conservatory attracted visitors throughout the year. "An unbroken display of flowers is maintained throughout the year, and the elegant palms and rare tropical fine foliaged plants elicit great admiration," reported Schenley Park Superintendent William Falconer in his year-end statement for 1896. The Easter plant display drew 15,000 visitors to the Phipps Conservatory that year, with 11,000 coming the next week while the show remained open. A chrysanthemum show surpassed all other exhibitions during the year, drawing 72,000 people for the month-long event.[7]

In the well-known story about the park's origins in 1889, E. M. Bigelow, director of Pittsburgh's Department of Public Works, sped to England to meet a former Pittsburgh resident and secure a land donation before a rival applicant purchased the acreage. Heiress to a Pittsburgh fortune, a young Mary Elizabeth Croghan married the older, widowed, and English Capt. Edward E. H. Schenley and eloped to England. They returned for visits to Pittsburgh, but Mrs. Schenley lived for the rest of her life in her adopted home of England. Bigelow pursued a donation that Mrs. Schenley had offered two decades earlier but withdrawn after a controversy erupted in Pittsburgh over whether the city should fund the purchase of park land. With Pittsburgh's entry into the parks movement, opposition to publicly funded recreation lands faded, and Bigelow undertook the dramatic 1889 journey to London with Robert B. Carnahan, who represented Mrs. Schenley's business interests, to plead the city's case anew. The two barely beat a businessman to their benefactor, arranging for her to donate about three hundred acres of land and to allow the city to purchase one hundred more at a later date.[8]

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[5] Pittsburgh, *Annual Report ... 1896,* 330-31.

[6] Pittsburgh, *Annual Report ... 1896*, 333.

[7] City of Pittsburgh, Engineer's Office, "In-Depth Inspection Report, Schenley Park Bridge Over Panther Hollow" (Acres America, Inc., for City of Pittsburgh Department of Public Works, June 1981), copy of plan enclosed with report; and Pittsburgh, *Annual Report ... 1896,* 329. Schenley and Highland parks both had conservatories, and they engaged in a friendly competition over their chrysanthemum shows. See "Park Makers Start A War," *Pittsburg Post,* 8 Aug. 1896. For an indication of the enormous horticultural project at Schenley, see *Pittsburg Post*, "160,000 Trees."

[8] Christina M. Schmidlapp, "Schenley Park," Allegheny County, Pennsylvania, National Register of Historic Places Registration Form, 1985, U.S. Department of the Interior, National Park Service, Washington, D.C.; and Samuel Harden Church, A *Short History of Pittsburgh, 1758-1908* (New York: DeVinne Press, 1908). Two secondary sources provide good details about the parks program and the personalities involved, although both sometimes mistakenly report dates relevant to adjacent areas as completion dates for bridge work: Christina M. Schmidlapp, "Pittsburgh's Park of a Century," *Pennsylvania Heritage* (Spring 1986): 32-36; Howard B. Stewart, "Historical Data: Pittsburgh Public Parks" (typescript, 1943), 32-33, in Drawer 5, Cabinet IV, Print Collection, Series I, James D. Van Trump Library, Pittsburgh History and Landmarks Foundation, Pittsburgh, Pa. A third

Fabricating Nature

Schenley Park became the jewel in Pittsburgh's system of parks. Bigelow was enthusiastic about the efforts made toward long-term plans for the Mount Airy tract in his report for 1895:

> The work of transforming what were for the most part stretches of vacant ground, broken here and there with old buildings, into sightly pleasure grounds, traversed by shady drives and walks, connected by convenient bridges, has now advanced so toward completion that nature works visibly hand in hand with us in adding to their beauty from year to year.[9]

A snapshot taken in 1896 would have revealed eight miles of recently constructed macadam roadways for bicycling or carriage touring through the park, the Phipps Conservatory's special collections of tropical and domestic plants, and continuing construction on a new zoological center.[10] Descriptions of the park published within the next four years described it as a gathering place for enjoying both nature and public entertainment. Cowboy actors performed skits about life in the wild west to crowds at the speedway, spectators watched a horse named Queen dive from an elevated platform into water below, and a lighted electric fountain attracted evening park goers with its bubbling, hour-long display.[11]

Schenley was one of eight parks under the city's control in 1896, comprising 874 acres. Landscape architects reshaped the rugged terrain into a "natural" environment, adjusting slopes to create the dramatic vistas for which the park became known. The grading of Panther Hollow from the top bank to the bridle path did not mean merely forming a gentle slope. According to park superintendent William Falconer,

> Grading in these cases does not mean a simple smoothing over of the surface of the ground. Prominent, rigid, abrupt banks or breasts of rock and clay have been removed wide and deep enough to allow the introduction of natural-appearing graceful sloping waves instead; this necessitated much excavation....[12]

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source is R. J. Gangewere, "Schenley Park," *Carnegie Magazine* 53 (June 1979): 60-68. See also City of Pittsburgh, *Annual Report of the Department of Public Works, 1895* (Pittsburgh: W. T. Nicholson, 1896), 16.

[9] Pittsburgh, *Annual Report ... 1895,* 16-17.

[10] Pittsburgh, *Annual Report ... 1896,* 11.

[11] "Western Scenes Out at Schenley," *Pittsburg Post,* 5 July 1896; "Queen," *Pittsburg Bulletin: A Weekly Journal for the Home,* 6 Oct. 1900; Pittsburgh, *Annual Report ... 1896,* 333.

[12] Pittsburgh, *Annual Report ... 1896,* 335.

A total of 112,200 square yards had been graded by the end of 1896, creating the views enjoyed by visitors from carriages or bicycles.[13] While allocating less than $10,000 on salaries for park personnel and about $18,000 for supplies in 1896, the budget for Schenley Park provided about $195,000 — nearly seven times as much — for contract grading and paving. Yet city officials often expressed their belief that the dramatic vistas were created by the city at a relatively low cost due to the existing rugged terrain.

Park Bridges

Bridges were necessary to make the scenic views and new drives fully accessible. Under Bigelow's hand, the city spent as much building bridges in Schenley Park during 1896 as was recommended for renovating the recently acquired Monongahela river crossings.[14] The park project came at the end of nearly a decade of spending on a massive public works program that literally changed the face of Pittsburgh in the 1890s. The average citizen "can have no just conception of the extent to which a new Pittsburg has been built within the last eight years," wrote Bigelow in his annual report for 1895. The city relaid virtually every paved road, expanded sewer and water services, and constructed numerous bridges to connect neighborhoods to one another, and began plans to construct wide boulevards which continue to connect downtown to Schenley Park.[15]

The Parks Bureau planned for three major bridges in Schenley Park during the mid-1890s.[16] Construction on the first, best known as the Panther Hollow Bridge, started in September 1895 and was finished in 1896. Dedication ceremonies were scheduled for 1 August. The bridge's completion signaled another step in the maturity of Bigelow's designs. The structure carried pedestrians and motorists across a deep ravine and creek, providing a vital link between Phipps Conservatory and the interior of the lavishly landscaped park. Falconer noted, "It is greatly appreciated by visitors, and is a convenient and near way to the zoo and the speedway, and it opens up to the public a well-wooded and beautiful part of the park that before now was visited by few, because of the inconvenience in getting there."[17]

The bridge provided "a very much needed connection," noted Bigelow, especially in light of the continuing work on the two other proposed bridges for park roadways.[18] Even more reflective of the city's concern for making the park accessible at all points inside is the

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[13] Pittsburgh, *Annual Report ... 1896,* 333-34.

[14] Pittsburgh, *Annual Report ... 1896,* 9-10.

[15] Pittsburgh, *Annual Report ... 1895,* 9-12.

[16] Pittsburgh, *Annual Report ... 1896,* 334.

[17] Pittsburgh, *Annual Report ... 1896,* 334.

[18] Pittsburgh, *Annual Report ... 1896,* 11.

proportional spending for such work: more than half of the Bureau of Parks' $527,000 budget for Schenley Park in 1896 focused on constructing the three bridges.[19] In 1896, the Bureau of Parks budgeted nearly $117,000 toward the cost of erecting the Panther Hollow structure and about $166,000 for the two other bridges.[20] In total, the city paid $167,700 for the structure, just $200 more than the contract price.[21]

Designers and Contractors

The Department of Public Works originated plans for the Panther Hollow Bridge, but the individual designer's identity is unclear. Project drawings include two aspects particularly relevant to studying technological history at the turn of the century: graphical calculations and a subtle aesthetic philosophical statement about the relationship of technology, humans, and nature.

An erection diagram for the structure prepared by Schultz Bridge & Iron Works shows the structure supported by falsework and the resulting member forces, and would be familiar to modern engineers.[22] A third element of the drawing presents structural analyses in a graphical format used until the mid-twentieth century but since discarded from engineering training. The scale in "strains" shows the forces on members, with a scale of 200,000 pounds to the inch drawn below for converting the zigzagging lines between panel points into force results.[23]

The project proposal drawing reveals further insights into the context of the bridge's construction. The proposal shows the elevation and a cross section of the steel and stone arch spans, with simple dimensions of span, height of the springing line, rise, and roadway and sidewalk widths.[24] An architectural sensibility permeates the drawing, from the shadow lines in the delineation of the stone arch to the roadway supports, which are shown lighter than in the as-

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[19] "Start To Build Park Bridges," *Pittsburg Post,* 6 July 1896; Pittsburgh, *Annual Report ... 1896,* 334, 336. The date for the bridge's dedication is often reported as being that of the first two panther sculptures, which occurred in early July 1897. Although the contractor expected the ceremony to be held 1 August, no mention of the event was found in local newspapers during that month.

[20] Pittsburgh, *Annual Report ... 1896,* 36.

[21] "The Panther Hollow Bridge, Pittsburg, Pa.," *Engineering Record* 38, No. 1 (4 June 1898): 5; and City of Pittsburgh, *Annual Reports of the Executive Departments of the City of Pittsburgh for the Year Ending January 31, 1912,* vol. 1 (Pittsburgh: Pittsburgh Publishing Co., 1912), Table 3. Table 3 is an invaluable reference that lists all city-owned bridge, dimensions, contractors, contract prices, and dates of construction as of 1912. Dates occasionally differ by one year from those of known completion, possibly because of a difference in the date of payment and completion. Some data about early bridges at those sites is also included.

[22] City of Pittsburgh, Engineer's Office, "Erection Diagram, Sheet No. 12" Drawing No. F-2795, n.d.

[23] Justin M. Spivey, HAER engineer, personal conversation, July 1998.

[24] City of Pittsburgh, Engineer's Office, "Project for Proposed Crossing of Panther Hollow," Drawing No. F-2776, n.d.

built structure. The details of greenery in urns on the approaches, light posts with triple globes, and suggested lion sculptures on either end contrast with the relatively sparse structural details. Although a four-ribbed arch supporting the roadway was indeed built, the original proposal for one stringer between each pair of ribs and cables for diagonal bracing differed from the as-built structure. The final structure included two stringers between ribs, stronger trussing under the roadway, and bars instead of cables for bracing.[25]

Curiously, a small figure of a man with hat and walking stick appears beneath the bridge, drawn nearly in proportion to actual human size. Traditional Chinese paintings emphasize the magnificence of nature by depicting the humans, cattle, or farmhouses as insignificant intrusions on a landscape of precipitous mountains. Using the same style, the bridge's rendition produces an ironic effect. The bridge elevation unites *Homo sapiens* and *Homo faber,* with the built world magnifying instead of diminishing human presence. The drawing subtly refers to faith in human ability to improve upon nature, echoing the Park Department's work in grading and reshaping the slopes of Schenley Park.[26]

The first drawing was probably prepared by a consulting architect or engineer with artistic training. The Department of Public Works received credit on other drawings, with the signatures of Director Bigelow and an engineer named Paul Brighton also sporadically present, but the creator of the initial proposal is unnamed. H. B. Rust, engineer in charge of the Bureau of Parks, may have been involved with the design over and above his duties as engineer. Historians Carl W. Condit and Donald C. Jackson cite Rust in their descriptions of the Panther Hollow Bridge, and this has encouraged a common belief that Rust himself designed the bridge. However, no information available through the City of Pittsburgh's Department of Engineering and Construction files makes any connection between Rust and the design. Henry Grattan Tyrrell noted that Rust directed construction of a later Schenley Park bridge, completed in 1897 for $240,000. That bridge was "quite similar" to the Schenley Park Bridge over Panther Hollow completed the year before: the 1897 structure also was a 360'-0" three-hinged steel arch over steep terrain, was 620'-0" long overall and 80'-0" wide, and had 50'-0" stone arches on each

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[25] City of Pittsburgh, Engineer's Office, "Proposed Crossing"; and City of Pittsburgh, Engineer's Office, "Floor System," Drawing No. F-2783, n.d.

[26] For excellent discussions of these concepts in a technological context, see David E. Nye, *The Technological Sublime* (Cambridge, Mass.: MIT Press, 1994); and George Basalla, *The Evolution of Technology* (New York: Cambridge Univ. Press, 1988). Compare the drawing to photos of Panther Hollow from 1908 — one showing a distant view of a panther sculpture and men working in ravine below; another showing sub-grade of bridle path on north side of bridge — in the City Photographer's Collection, Archives of Industrial Society, Hillman Library, University of Pittsburgh, Pittsburgh, Pa.

side.[27] Different contractors erected the bridges, however: Drake and Stratton constructed the later structure, whereas Schultz Bridge & Iron Works built the first bridge over Panther Hollow.[28]

Schultz Bridge & Iron Works operated from about 1890 until 1900 at nearby McKee's Rocks, and has appeared in some publications as Schultz Bridge & Iron Company. The company had its roots in a firm founded around 1850 by C. J. Schultz, which began providing iron components for wood bridges but became the nation's first manufacturer of steel bridge materials.[29] Schultz Bridge & Iron Works was active in Pittsburgh bridge construction from 1896 to 1901, building structures at South Twentieth-Second Street in 1896, at South Highland Avenue over Pennsylvania Railroad tracks in 1898, at South Main Street over Saw Mill Run in 1900, and another three-hinged steel arch, the Forbes Street Bridge over Nine-Mile Run 1901.[30]

Albert L. Schultz, son of the company's founder, supervised engineering for Schultz Bridge & Iron Works' contract at Panther Hollow. After studying in Berlin at the Royal Polytechnic Institute and returning to Pittsburgh, the younger Schultz worked briefly with the Iron City Bridge Company, then became president of the Schultz Bridge & Iron Works. Upon the formation of the American Bridge Company in 1900, he "was one of the first to merge his company into the present combination," eventually becoming director of the Operating Department for American Bridge. He contributed to the city's short-lived experiment with cable railways in the 1890s but was chiefly known for his involvement with bridge projects in the Pittsburgh area.[31]

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[27] Carl W. Condit, *American Building Art: The Nineteenth Century* (New York: Oxford Univ. Press, 1960), 192-93; Donald C. Jackson, *Great American Bridges and Dams* (Washington, D.C.: Preservation Press, 1988), 151; and Henry Grattan Tyrrell, *History of Bridge Engineering* (Chicago, 1911), 333-34.

[28] "Decks Cleared by Councils," *Pittsburg Post,* 3 July 1896. This article also mentioned that a Pittsburgh councilman was a member of Drake and Stratton, which won the bid for the 1897 bridge. Drake and Stratton's experience included masonry and foundation work for the third Sixth Street Bridge, designed by Theodore Cooper and completed in 1892; see W. G. Wilkins, "The Reconstruction of the Sixth Street Bridge at Pittsburg, Pa.," *Proceedings of the Engineers' Society of Western Pennsylvania* 11 (1895): 150-51, 161-62; and "The New Sixth Street Bridge, Pittsburgh, Pa.," *Railroad Gazette* (28 July 1893): 560.

[29] Victor C. Darnell, *A Directory of American Bridge-Building Companies, 1840-1900,* Occasional Publication No. 4 (Washington, D.C.: Society for Industrial Archaeology, 1984), 59. Although Darnell calls the variant "erroneous," the City of Pittsburgh Engineer's Office shop drawings for the Panther Hollow bridge bear the name "Schultz Bridge & Iron Co."

[30] Pittsburgh, *Annual Reports of Executive Departments.*

[31] Lewis R. Hamersly, *Who's Who in Pennsylvania,* 1st ed. (New York: L. R. Hamersly Co., 1904), 661.

Steel Arches

The Panther Hollow Bridge's main span is a three-hinged, spandrel-braced steel arch 360'-0" long, rising 45'-0" from the spring line (for a total height of about 115'-0" from the ground to the bottom chord at mid-span). In spandrel-braced arches, an upper chord supports the floor beams, upon which a deck rides. The arch ribs forming the lower chord may be constructed with a variety of sections: I-beams, H-beams, plate or box girders, or hollow tubes. Webbing, commonly a system of diagonals, joins the upper chord with the curved lower chord, or rib. The entire frame is denoted as the arch. Because of their resemblance to truss construction, spandrel-braced arches with open webbing are particularly well suited for metal arch designs, according to a 1931 treatise on arch construction by Conde B. McCullough and Edward S. Thayer.[32] An article in *Engineering Record* revealed that the Panther Hollow bridge's engineer designed the parabolic lower chord to support itself, merely accepting uniformly distributed loads through vertical and diagonal web members. Only for "special" (i.e., concentrated) loads would the web members exhibit truss action.[33]

Steel arches may be either fixed or hinged, but among the latter most have two or three hinges rather than one. Three-hinged arches are statically determinate, unlike the other types, meaning that an exact structural analysis is easily accomplished. The three-hinged design also eliminates secondary stress caused by temperature changes, shifting in supports, and other causes. As statically determinate structures, three-hinged metal arches make better subjects for close calculations, which can reduce the cost of materials, noted McCullough and Thayer.[34] This appealed to engineers who, in the wake of the Eads Bridge's success in St. Louis, wished to exchange trusses for more attractive arches. According to Condit, the Panther Hollow bridge's design perfectly fit the environment and specifications of the ravine. The bridge matched its location's requirements for retaining a clear view of the surroundings and selecting the most elegant type possible:

> In the rich quality of its simple, fine-textured masonry elements, in the lightness and purity of the arch, and in the sweeping curve of the parabola, with its 8:1 proportions, Panther Hollow Bridge satisfies these requirements as fully as it is possible to do so. It represents the culmination of thirty years of progressive development in the arch, and there are few structures of its kind that can match it.[35]

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[32] Conde B. McCullough and Edward S. Thayer, *Elastic Arch Bridges* (New York: John Wiley & Sons, Inc., 1931), 17-18.

[33] *Engineering Record,* "Panther Hollow Bridge," 4.

[34] McCullough, *Elastic Arch Bridges,* 18-19.

[35] Condit, *American Building Art,* 192-93.

Description

In addition to the 360'-0" steel arch span, stone abutments at either end, each pierced by two 28'-0" arch spans, extend the Panther Hollow bridge to its total length of 620'-0". Masonry plans for the approaches specified a main abutment pier of rough coursed stonework. Twenty-seven voussoirs, anchored by the number 14 keystone, form each of the closed-spandrel arches. Because of a projecting belt course, passages through the arches measure only 26'-9" from wall to wall, with a 10'-0" high column between the pair.[36]

The steel arch span springs from bridge seats 20'-0" thick and 70'-0" wide. Four box-section arch ribs rise from shoes on each seat to the 10"-diameter center hinge pin.[37] The shoes measure 5'-3" wide, 5'-1-3/4" high, and 4'-3" deep, with a 10"-diameter pin hole centered 3'-0" from the abutment side. The 6"-wide bearing surface was constructed out of laminated plates gusseted vertically into the angle of the shoe.[38]

Vertical and diagonal web members, mostly built-up box sections, connect the arch ribs to the deck, forming twenty truss panels each 18'-0" wide. Five-inch-diameter pins occur at each panel point, according to truss details prepared by Schultz Bridge & Iron Works.[39] An erection diagram for Panther Hollow Bridge showed falsework in four places. Following this plan, workers constructed wooden trestle bents under panel points L1 through L3, L5 through L7, L13 through L15, and L17 through L19, to support the arch during erection.[40]

The arch trusses are spaced 13'-6" on center, which accommodates a 39'-0"-wide roadway flanked by two cantilevered sidewalks each 10'-6" wide. Channel sections form crossed diagonal bracing in each panel between the arch ribs, as well as in transverse planes between vertical struts. The box-section upper chords occur at the same level as the roadway stringers, which are supported by 2'-10-1/2"-deep trussed floor beams running transversely. Cantilever brackets of similar trussed construction extend outward to support the sidewalks. Two 15"-deep I-beam stringers occur between each pair of ribs, and one 12"-deep I-beam stringer runs down the middle of each sidewalk, supporting Carnegie corrugated sheeting. The sidewalk received a 1-1/2" asphalt topping on concrete fill, separated by a 10"-high curb from the roadway, which was topped by a 2" asphalt layer on concrete fill.[41]

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[36] City of Pittsburgh, Engineer's Office, "Masonry Plan," Drawing No. F-2775, n.d.

[37] City of Pittsburgh, Engineer's Office, Drawing No. F-2788, n.d.

[38] City of Pittsburgh, Engineer's Office, "Shoe and Stringer Details," Drawing No. F-2792, n.d.

[39] City of Pittsburgh, Engineer's Office, "Truss Details A-B-C, Sheet No. 1," Drawing No. F-2784, 28 Jan. 1896.

[40] Pittsburgh, "Erection Diagram." Compare this drawing to City of Pittsburgh, Engineer's Office, Drawing No. F-2786, 28 Jan. 1896.

[41] Pittsburgh, "Floor System."

Decorative Features

Originally, a built-up hollow metal cornice combining angular and grooved faces supported an elaborate 3'-7"-high, wrought-iron hand railing. Separated by hexagonal paneled newel posts with scrolled and faceted caps, the railing design resembled interlocking paisley shapes with additional scrolled detailing. Over the abutments, stone balustrades interspersed with triple-globe light standards continue to pedestals for the famous panthers sculpted by Giuseppe Moretti, a locally prominent artist.[42]

During Independence Day celebrations at the bridge in 1897, city officials unveiled two of the panthers that soon became as much of an identifying symbol for the bridge as its elegant steel arch. Moretti's panthers were cast in bronze at the Gorham Manufacturing Company in Providence, Rhode Island. Each statue, with its 4'-6" x 6'-4" base, weighed 1050 to 1200 pounds. Two more of the muscled metallic creatures eventually completed a foursome guarding each corner of the bridge. The statues were said to be in tribute not to only the panthers for whom the hollow was named, but also in honor of Pittsburgh's colonial founders, who conquered a forbidding environment in establishing the western Pennsylvania city.[43]

Moretti also designed a statue of E. M. Bigelow for Schenley Park. Born in Sienna, Italy, around 1837, Moretti studied in Florence under renowned French sculptor Jean Duprez. Moretti completed works such as "Genesis of Electricity," which was displayed at an exposition in Nashville, Tennessee; large portraits for prominent citizens; and a local sculpture of Cornelius Vanderbilt that received acclaim for its verisimilitude.[44]

Conclusion

By no accident a steel arch was chosen to mesh with the natural topography and sculpted terrain of Schenley Park's Panther Hollow, a deep ravine making access difficult for park visitors. The Panther Hollow bridge's parabolic curves blended with the steep hillsides crossed by the structure, exemplifying the aesthetic concerns intrinsic to the parks movement. As a material, steel combined strength with flexibility, presenting a potent symbol of the new Pittsburgh elite whose growing fortunes derived from steel's versatility as a structural material in the late nineteenth century. The Panther Hollow bridge is a contributing structure to National Register-listed Phipps Conservatory and Schenley Park Historic District, and like them provides a metaphor for the entry of industrial elites into Pittsburgh's cultural inner circle during the late nineteenth century. Instead of merely walking across an existing structure to take command,

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[42] Pittsburgh, "Floor System," "Masonry Plan," and "Proposed Crossing."

[43] "Unveiling of the Panthers," *Pittsburg Post,* 4 July 1897; see also Marilyn Evert, *Discovering Pittsburgh's Sculpture* (Pittsburgh: Univ. of Pittsburgh Press, 1983), 190-91. Dates reported by bridge historians vary because local newspapers carried accounts without references to an exact day of the week or date.

[44] *Pittsburg Post,* "Unveiling."

civic leaders such as Department of Public Works director Bigelow constructed physical bridges to turn their own vision of the City Beautiful into fact.[45]

Despite subsequent renovations, the Panther Hollow bridge remains historically significant.[46] It was built as part of Pittsburgh's City Beautiful movement and the massive public works program that created the water, sewer, and paved road improvements marking Bigelow's tenure. Schenley Park Bridge over Panther Hollow combines structural elegance with an appropriate use of the locally-produced building material upon which Pittsburgh's late-nineteenth century prominence was based.[47] Along with street cleaning, reconstruction of traction routes, installing utilities for communication and electricity, and building boulevards to enhance the city, Bigelow showed a concern for beautification in the parks that mirrored a growing local movement. The construction of Panther Hollow Bridge continued this assertion of civic authority for public purposes without challenging the city's business interests, imprinting Pittsburgh with a new style of municipal leadership for the next century.

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[45] A popular local journalist penned satirical poems about Pittsburgh's most prominent citizens. The opening lines of a poem about E. M. Bigelow read:

> I am monarch of all I survey;
> My right there is no one to dispute;
> From the Hollow de Panther to points far away,
> I'm lord of the fowl and the brute.

See Arthur G. Burgoyne, *All Sorts of Pittsburgers, Sketched in Prose and Verse* (Pittsburg: Leader All Sorts Co., 1892), 17. See also Barbara Judd's evaluation of Bigelow's role in the Pittsburg parks movement, "Edward M. Bigelow: Creator of Pittsburgh's Arcadia Parks," *Western Pennsylvania Historical Magazine* 58, No. 1 (Jan. 1975): 53-67. For a study of the new and old elites in Pittsburgh's iron and steel industries during the nineteenth century, see John Ingham's *Making Iron and Steel: Independent Mills in Pittsburgh, 1820-1920* (Columbus: Ohio State Univ. Press, 1991).

[46] The City Photographer's Collection, Archives of Industrial Society, Hillman Library, University of Pittsburgh, contains several photos of construction begun in 1932 on the deck and sidewalks.

[47] Hamersly, *Who's Who,* 54.

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